

WHAT IS CLAIMED:

1. Extendible exhaust nozzle bell for a rocket engine of an aircraft or spacecraft which comprises a first part with smaller diameter fixedly arranged on the motor of the rocket engine and a second part with larger diameter arranged in a flexible manner with respect to the first part, whereby in a front stowed position the second part is located surrounding the first part closer to the rocket motor and in a rear operating position, continuing the first part, is arranged further away from the rocket motor, and with a closed volume that can be acted on by a gaseous fluid, which volume when acted on by the gaseous fluid under enlargement of the volume causes an extension of the second part of the exhaust nozzle bell from the stowed position into the operating position, wherein the closed volume that can be acted on by the gaseous fluid is formed at least in part by a deformable rolling bellows arrangement coupled between the flexibly arranged second part of the exhaust nozzle bell and a fixed part of the rocket engine or of the aircraft or spacecraft.
2. Exhaust nozzle bell according to claim 1, wherein the rolling bellows arrangement comprises at least one rolling bellows embodied essentially in a rotationally symmetrical manner with respect to the longitudinal axis of the rocket engine.
3. Exhaust nozzle bell according to claim 2, wherein the at least one rolling bellows is embodied circulating over the entire circumference of the exhaust nozzle bell.
4. Exhaust nozzle bell according to claim 1, wherein the rolling bellows arrangement comprises a first rolling bellows that, forming a seal for the gaseous fluid, is connected on the one hand to a circumferential area of the first part of the exhaust nozzle bell or another fixed part of the aircraft or spacecraft and on the other hand to a circumferential area of the second part of the exhaust nozzle bell, and a second bellows that forms a further seal of the volume for the gaseous fluid limited by the first rolling bellows.

5. Exhaust nozzle bell according to claim 4, wherein the second bellows is a sealing bellows that closes the jet opening of the second part of the exhaust nozzle bell and together with the first rolling bellows and the first and second part of the exhaust nozzle bell limits the closed volume acted on by the gaseous fluid inside the exhaust nozzle bell.

6. Exhaust nozzle bell according to claim 5, wherein the circumferential area of the first part of the exhaust nozzle bell to which the first rolling bellows on the one hand is connected is provided on the rear end of the first part of the exhaust nozzle bell, and that the circumferential area of the second part of the exhaust nozzle bell to which the first rolling bellows on the other hand is connected, is located on the front end of the second part of the exhaust nozzle bell.

7. Exhaust nozzle bell according to claim 5, wherein the sealing bellows features a preset breaking point at which the sealing bellows bursts open after the extension of the second part of the exhaust nozzle bell into the operating position in order to clear the jet opening.

8. Exhaust nozzle bell according to claim 4, wherein the second bellows is a second rolling bellows which on the one hand is connected to a fixed part of the aircraft or spacecraft, and on the other hand to a circumferential area of the second part of the exhaust nozzle bell, and forms a further seal for the gaseous fluid which seal lies at least in part radially outside with respect to the first rolling bellows, whereby the closed volume that can be acted on by the gaseous fluid is located at least in part outside the exhaust nozzle bell and is limited between the first rolling bellows and the second rolling bellows.

9. Exhaust nozzle bell according to claim 8, wherein the circumferential area of the second part of the exhaust nozzle bell to which the second rolling bellows is connected is essentially the same circumferential area of the second part of the exhaust nozzle bell to which the first rolling bellows is also connected.

10. Exhaust nozzle bell according to claim 8, wherein the circumferential area of the second part of the exhaust nozzle bell to which the second rolling bellows is connected is different from the circumferential area to which the first rolling bellows is connected and is located radially outside and to the rear of the latter.

11. Exhaust nozzle bell according to claim 1, wherein a retaining device is provided to brake the movement during the extension of the second part of the exhaust nozzle bell from the stowed position into the operating position.

12. Exhaust nozzle bell according to claim 11, wherein the retaining device is provided at the same time to center the second part of the exhaust nozzle bell during the extension from the stowed position into the operating position.

13. Exhaust nozzle bell according to claim 11, wherein the retaining device comprises one or more retaining cables coupled with a cable brake and extending between the second part of the exhaust nozzle bell and a fixed part of the aircraft or spacecraft.

14. Exhaust nozzle bell according to claim 11, wherein the retaining device comprises a retaining bellows that extends between a circumferential area of the first part of the exhaust nozzle bell and a circumferential area of the second part of the exhaust nozzle bell and is arranged at the front with respect to the first rolling bellows and together with the first rolling bellows forms a further closed volume that can be acted on with a gaseous fluid, which volume when acted on with the gaseous fluid under enlargement of the volume causes a braking of the movement during the extension of the second part of the exhaust nozzle bell from the stowed position into the operating position.

15. Exhaust nozzle bell according to claim 14, wherein the retaining bellows is fixed to a circumferential area of the second part of the exhaust nozzle bell, which area is located radially outside the circumferential area to which the first rolling bellows is connected.

16. Exhaust nozzle bell according to claim 14, wherein the retaining bellows are arranged between the first rolling bellows and the second rolling bellows.

17. Exhaust nozzle bell according to claim 11, wherein the retaining device comprises a retaining and centering bellows extending between a front circumferential area of the first part and a front circumferential area of the second part of the exhaust nozzle bell.

18. Exhaust nozzle bell according to claim 11, wherein the retaining device comprises a retaining and centering bellows extending between a rear circumferential area of the first part and a rear circumferential area of the second part of the exhaust nozzle bell.

19. Exhaust nozzle bell according to claim 17, wherein the retaining and centering bellows are embodied such that it bursts or is separated, in particular through a preset breaking point, during the extension of the second part of the exhaust nozzle bell, at the latest after the operating position of the second part is reached.